

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/662,619 Confirmation No.: 9762
Applicant: Hyun Jin Kim et al.
Filed: September 15, 2003
Title: GOLF BALLS INCORPORATING PEPTIZERS
AND METHOD OF MANUFACTURE

Examiner: Raeann Gordon
Art Unit: 3711

Docket No.: 0EKM-104792
Date: June 6, 2006

AMENDMENT AFTER FINAL REJECTION

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

This is responsive to the Office Action mailed February 10, 2006.

Amendments to the Claims begin on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A golf ball including a composition comprising:

- an unsaturated polymer;
- a cross-linking agent comprising a peroxide;
- a peptizer including a non-metal salt of an organic sulfur compound; and
- an accelerator.

Claim 2 (original): The golf ball according to claim 1, wherein the composition includes greater than about 0.1 part by weight of the peptizer per 100 parts by weight of the unsaturated polymer.

Claim 3 (original): The golf ball according to claim 1, wherein the composition includes greater than about 0.5 part by weight of the peptizer per 100 parts by weight of the unsaturated polymer.

Claim 4 (original): The golf ball according to claim 1, wherein the composition includes greater than about 2.5 parts by weight of the peptizer per 100 parts by weight of the unsaturated polymer.

Claim 5 (previously presented): The golf ball according to claim 1, wherein the peptizer includes a non-metal salt of pentachlorothiophenol.

Claim 6 (original): The golf ball according to claim 1, wherein the composition includes from about 0.1 part to about 10 parts by weight of the accelerator per 100 parts by weight of the unsaturated polymer.

Claim 7 (original): The golf ball according to claim 1, wherein the composition includes from about 0.2 part to about 5 parts by weight of the accelerator per 100 parts by weight of the unsaturated polymer.

Claim 8 (original): The golf ball according to claim 1, wherein the composition includes from about 0.5 part to about 1.5 parts by weight of the accelerator per 100 parts by weight of the unsaturated polymer.

Claim 9 (original): The golf ball according to claim 1, wherein the accelerator is selected from the group consisting of 2-mercaptobenzothiazole and a salt of 2-mercaptobenzothiazole.

Claim 10 (original): The golf ball according to claim 1, wherein the composition includes from about 0.05 part to about 5 parts by weight of the cross-linking agent per 100 parts by weight of the unsaturated polymer.

Claim 11 (original): The golf ball according to claim 1, wherein the composition includes from about 0.2 part to about 3 parts by weight of the cross-linking agent per 100 parts by weight of the unsaturated polymer.

Claim 12 (original): The golf ball according to claim 1, wherein the composition includes from about 0.5 part to about 1.5 parts by weight of the cross-linking agent per 100 parts by weight of the unsaturated polymer.

Claim 13 (original): The golf ball according to claim 1, wherein the unsaturated polymer is selected from the group consisting of 1,2-polybutadiene, cis-1,4-polybutadiene, trans-1,4-polybutadiene, cis-polyisoprene, trans-polyisoprene, polychloroprene, polybutylene, styrene-butadiene rubber, block copolymer of styrene and butadiene, block copolymer of styrene and isoprene, nitrile rubber, silicone rubber, polyurethane, and mixtures thereof.

Claim 14 (previously presented): The golf ball according to claim 1, wherein the composition further comprises one or more ingredients selected from the group consisting of UV stabilizers, photo stabilizers, antioxidants, colorants, dispersants, mold releasing agents, processing aids, and fillers.

Claim 15 (previously presented): The golf ball according to claim 14, wherein the one or more ingredients include a filler that adjusts a density of the composition.

Claim 16 (previously presented): The golf ball according to claim 14, wherein the one or more ingredients include a filler selected from the group consisting of zinc oxide, tungsten, and barium sulfate.

Claim 17 (previously presented): The golf ball according to claim 14, wherein the one or more ingredients include a filler and the composition includes from about 10 parts to about 80 parts by weight of the filler per 100 parts by weight of the unsaturated polymer.

Claim 18 (original): The golf ball according to claim 1, wherein the composition further comprises a compound selected from the group consisting of an unsaturated carboxylic acid, a metal salt of the unsaturated carboxylic acid, and mixtures thereof.

Claim 19 (original): The golf ball according to claim 18, wherein the composition includes from about 20 parts to about 60 parts by weight of the compound per 100 parts by weight of the unsaturated polymer.

Claim 20 (original): The golf ball according to claim 1, further comprising:
a core; and
a cover layer over the core;
wherein at least one of the core and the cover layer includes the composition.

Claim 21 (original): The golf ball according to claim 20, wherein the core includes:
an inner core; and
an outer core encasing the inner core.

Claim 22 (original): The golf ball according to claim 20, wherein the core includes a material in liquid form.

Claim 23 (original): The golf ball according to claim 20, further comprising a layer of rubber thread located between the core and the cover layer.

Claim 24 (original): The golf ball according to claim 1, further comprising:

a core;

at least one intermediate layer over the core; and

a cover layer over the outermost intermediate layer;

wherein at least one of the core, the at least one intermediate layer, and the cover layer includes the composition.

Claim 25 (previously presented): A golf ball including a composition comprising:

an unsaturated polymer;

a cross-linking agent comprising a peroxide;

a peptizer including a non-metal salt of an organic sulfur compound; and

an accelerator;

wherein the composition includes:

from about 0.2 part to about 3 parts by weight of the cross-linking agent per 100 parts by weight of the unsaturated polymer,

greater than about 0.5 part by weight of the peptizer per 100 parts by weight of the unsaturated polymer, and

from about 0.2 part to about 5 parts by weight of the accelerator per 100 parts by weight of the unsaturated polymer.

Claim 26 (original): The golf ball according to claim 25, wherein the composition includes greater than about 2.5 parts by weight of the peptizer per 100 parts by weight of the unsaturated polymer.

Claim 27 (previously presented amended): The golf ball according to claim 25, wherein the peptizer includes a non-metal salt of pentachlorothiophenol.

Claim 28 (original): The golf ball according to claim 25, wherein the accelerator is selected from the group consisting of 2-mercaptobenzothiazole and a salt of 2-mercaptobenzothiazole.

Claim 29 (original): The golf ball according to claim 25, wherein the unsaturated polymer is selected from the group consisting of 1,2-polybutadiene, cis-1,4-polybutadiene, trans-1,4-polybutadiene, cis-polyisoprene, trans-polyisoprene, polychloroprene, polybutylene, styrene-butadiene rubber, block copolymer of styrene and butadiene, block copolymer of styrene and isoprene, nitrile rubber, silicone rubber, polyurethane, and mixtures thereof.

Claim 30 (previously presented): The golf ball according to claim 25, wherein the composition further comprises one or more ingredients selected from the group consisting of UV stabilizers, photo stabilizers, antioxidants, colorants, dispersants, mold releasing agents, processing aids, and fillers.

Claim 31 (previously presented): The golf ball according to claim 30, wherein the one or more ingredients include a filler that adjusts a density of the composition.

Claim 32 (previously presented): The golf ball according to claim 30, wherein the one or more ingredients include a filler selected from the group consisting of zinc oxide, tungsten, and barium sulfate.

Claim 33 (previously presented): The golf ball according to claim 30, wherein the one or more ingredients include a filler and the composition includes from about 10 parts to about 80 parts by weight of the filler per 100 parts by weight of the unsaturated polymer.

Claim 34 (original): The golf ball according to claim 25, wherein composition further comprises a compound selected from the group consisting of an unsaturated carboxylic acid, a metal salt of the unsaturated carboxylic acid, and mixtures thereof.

Claim 35 (original): The golf ball according to claim 34, wherein the composition includes from about 20 parts to about 60 parts by weight of the compound per 100 parts by weight of the unsaturated polymer.

Claim 36 (original): The golf ball according to claim 25, further comprising:

a core; and

a cover layer over the core;

wherein at least one of the core or cover layer includes the composition.

Claim 37 (original): The golf ball according to claim 36, wherein the core includes:

an inner core; and

an outer core encasing the inner core.

Claim 38 (original): The golf ball according to claim 36, wherein the core includes a material in liquid form.

Claim 39 (original): The golf ball according to claim 36, further comprising a layer of rubber thread located between the core and the cover layer.

Claim 40 (original): The golf ball according to claim 25, further comprising:

a core;

at least one intermediate layer over the core; and

a cover layer over the outermost intermediate layer;

wherein at least one of the core, the at least one intermediate layer, and the cover layer includes the composition.

Claim 41 (previously presented): A method for manufacturing a golf ball, the method comprising:

providing:

an unsaturated polymer,

a cross-linking agent comprising a peroxide,

a peptizer including a non-metal salt of an organic sulfur compound, and

an accelerator;

preparing a composition from the unsaturated polymer, the cross-linking agent, the peptizer, and the accelerator; and

forming the composition into the golf ball.

Claims 42-47 (canceled).

Claim 48 (previously presented): The golf ball according to claim 1, and further comprising a co-cross-linking agent that is a metal salt of an unsaturated carboxylic acid.

Claim 49 (canceled).

Claim 50 (previously presented): The golf ball according to claim 1, wherein the peptizer is selected from the group consisting of an amine salt of pentachlorothiophenol, an ammonium salt of pentachlorothiophenol, and mixtures thereof.

Claim 51 (currently amended): The golf ball according to claim 1, wherein the cross-linking agent is selected from the group consisting of diacetyl peroxide; di-tert-butyl peroxide; dibenzoyl peroxide; dicumyl peroxide; 2,5-dimethyl-2,5-di(benzoylperoxy)hexane; 1,4-bis-(t-butylperoxyisopropyl-)benzene, t-butylperoxybenzoate; ~~2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3~~ 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3; 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane; and di-(2,4-dichlorobenzoyl)peroxide; ~~and mixtures thereof.~~

Claim 52 (currently amended): The golf ball according to claim 51, wherein the cross-linking agent includes ~~2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3~~ 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3 and 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane.

Claim 53 (previously presented): The golf ball according to claim 25, and further comprising a co-cross-linking agent that is a metal salt of an unsaturated carboxylic acid.

Claim 54 (canceled).

Claim 55 (previously presented): The golf ball according to claim 25, wherein the peptizer is selected from the group consisting of an amine salt of pentachlorothiophenol, an ammonium salt of pentachlorothiophenol, and mixtures thereof.

Claim 56 (currently amended): The golf ball according to claim 25, wherein the cross-linking agent is selected from the group consisting of diacetyl peroxide; di-tert-butyl peroxide; dibenzoyl peroxide; dicumyl peroxide; 2,5-dimethyl-2,5-di(benzoylperoxy)hexane; 1,4-bis-(t-butylperoxyisopropyl-)benzene, t-butylperoxybenzoate; ~~2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3~~ 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3; 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane; and di-(2,4-dichlorobenzoyl)peroxide; ~~and mixtures thereof.~~

Claim 57 (currently amended): The golf ball according to claim 56, wherein the cross-linking agent includes ~~2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3~~ 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3 and 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane.

Claims 58-62 (canceled).

Claim 63 (new): The golf ball according to claim 51, wherein the cross-linking agent includes 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane.

Claim 64 (new): The golf ball according to claim 56, wherein the cross-linking agent includes 1,1-bis(t-butylperoxy)-3,3,5 tri-methylcyclohexane.

REMARK/ARGUMENTS

Applicants respectfully request reconsideration of this application in view of the foregoing amendments to the claims and the following comments.

In the Office Action mailed February 10, 2006, claims 1-41, 48-57, 61, and 62 were examined and rejected as follows:

- Claims 51, 52, 56, and 57 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.
- Claims 1-22, 24-38, 40, 41, 48, 49, 51, 53, 54, 56, 61, and 62 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over U.S. Patent Appl. Publ. No. 2001/0031669 to Ohama (the "Ohama publication"), in view of U.S. Patent No. 6,561,926 to Hayashi et al. (the "Hayashi patent").
- Claims 23 and 39 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over the Ohama publication in view of the Hayashi patent and further in view of U.S. Patent Appl. Publ. No. 2001/0000506 to Sullivan (the "Sullivan publication").

Applicants note with appreciation that claims 50 and 55 were acknowledged to be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

By this Amendment, Applicants have amended claims 51, 52, 56, and 57, to overcome the rejection under 35 U.S.C. § 112. Applicants also have canceled claims 61 and 62, without prejudice, and have added new claims 63 and 64. Fifty one claims are presented for reconsideration, including independent claim 1 and its dependent claims 2-24, 48, 50-52, and 63; independent claim 25 and its dependent claims 26-40, 53, 55-57 and 64; and independent claim 41.

The Rejection of Claims Under 35 U.S.C. § 112, First Paragraph

As mentioned above, claims 51, 52, 56, and 57 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Specifically, the Examiner asserted as follows:

“Claims 51 and 56, the specification does not support ‘mixtures thereof’ for the peroxides/crosslinkers. Claims 52 and 57, the specification does not support a combination of peroxides.”

Applicants disagree with the Examiner’s assertions. Nevertheless, Applicants have now amended claims 51, 52, 56, and 57 to eliminate the language giving rise to this rejection. Specifically, claims 51 and 56 have been amended to delete the phrase “and mixtures thereof,” and claims 52 and 56 have been amended to delete the second of the two recited cross-linking agents. All four of these claims also have been amended to correct an inadvertent typographical error in identifying the cross-linking agent 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3.

In view of these amendments, the § 112 rejection of claims 51, 52, 56, and 57 should now be withdrawn.

The Rejection of Claims Under 35 U.S.C. § 103(a)

As mentioned above, claims 1-41, 48, 49, 51, 53, 54, 56, 61, and 62 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over the Ohama publication in view of the Hayashi patent and, in the case of claims 23 and 39, further in view of the Sullivan publication. Claims 50, 52, 55, and 57 were not rejected under § 103(a).

By this Amendment, Applicants have canceled claims 61 and 62, but they respectfully traverse the rejections of the remaining claims.

In her comments supporting the rejection of independent claims 1, 25, and 41, the Examiner asserted that the Ohama publication discloses all of features recited in these claims, including the use of pentachlorothiophenol (an organic sulfur compound) as a peptizer, but she acknowledged that the publication fails to disclose “specific types such as metal salts or nonmetal salts [thereof].” To make up for this deficiency, the Examiner further asserted that the Hayashi patent “teaches a golf ball comprising thiophenols and specifically teaches halogenated (nonmetal) thiophenols.” Unstated in the Office Action was the tacit implication that it would have been obvious to have used Hayashi’s halogenated thiophenols as the pentachlorothiophenol constituent in Ohama’s composition.

Applicants respectfully disagree with the Examiner's assertion about the obviousness of using Hayashi's halogenated thiophenol as the pentachlorothiophenol constituent in Ohama's composition, but note that even if that were done, the resulting composition would *not* correspond to the composition defined in independent claims 1, 25, or 41.

Independent claims 1, 25, and 41 all call for a peptizer including "a non-metal salt of an organic sulfur compound." Hayashi's halogenated thiophenol is *not* such a non-metal *salt*. Merriam Webster's on-line dictionary (<http://m-w.com>) defines a salt as follows:

salt: 1.d. any of numerous compounds that result from replacement of part or all of the acid hydrogen of an acid by a metal or a group acting like a metal: an ionic crystalline compound.

Thus, a salt must contain both a positively charged component (i.e., a cation) and a negatively charged component (i.e., an anion). Hayashi's halogenated thiophenol is *not* an ionic compound and thus fails to meet this definition. Moreover, the Hayashi patent fails to suggest substituting an ionic thiophenol for the disclosed halogenated thiophenol.

For this reason, the § 103(a) rejection of independent claims 1, 25, and 41 is improper and should be withdrawn.

Claims 2-24, 48, and 50-52 all depend from independent claim 1, and claims 26-40, 53, and 55-57 all depend from independent claim 25. These dependent claims all add features that more particularly define the invention and thus further distinguish over the cited Ohama, Hayashi, and Sullivan references. These dependent claims, likewise, should be allowed.

New Claims 63 and 64

By this Amendment, Applicants have added new claims 63 and 64, which depend from amended dependent claims 51 and 56, respectively. These new dependent claims more particularly define the cross-linking agent to comprise the particular agent that has now been deleted from dependent claims 52 and 57, as discussed above.

New claims 63 and 64 both are properly allowable.

Conclusion

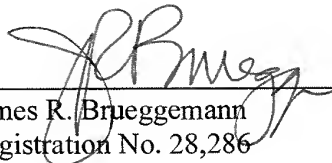
Thus, 51 claims are presented for reconsideration. This includes independent claim 1 and its dependent claims 2-24, 48, 50-52, and 63; independent claim 25 and its dependent claims 26-40, 53, 55-57, and 64; and independent claim 41. All of these claims should be in condition for allowance.

This application should now be in condition for a favorable action. Allowance of the application is respectfully requested. If the Examiner believes that a telephone conference with Applicants' undersigned attorney of record might expedite prosecution of the application, she is invited to call at the telephone number indicated below.

Respectfully submitted,

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